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Mr. Chip Humphrey
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Region 10
811 SW 6th Avenue, 3rd Floor
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Dear Ms. Martich and Mr. Humphrey:

The Fish and Wildlife Service (Service) offers the following comments on the *Portland Harbor RI/FS Programmatic Work Plan*, revised draft final, November 13, 2003 (Work Plan).

Page 4. The bulleted lists states that species listed under the Endangered Species Act will be evaluated in the Work Plan, yet elsewhere in the document other terms are used to indicate special status species. Special status species should be defined in the document, and the correct designations for both State and federally listed species should be correctly used and listed on Page 4 and elsewhere in the document. What status does the Lower Willamette Group (LWG) plan to protect and evaluate on an individual basis in the risk assessment? Federally protected species can include threatened, endangered, proposed, and candidate species. All these species should be protected at the individual level, and this should be mentioned in the document. The level of protection for the State species of special concern should also be identified, and the LWG should define how they will protect species within each level (i.e., individually or otherwise). Some of this information appears in Table 2-8, but it is unclear what levels of protection will be given to these species.

Pages 11 to 13. The Assessment Endpoints for fish, birds, and mammals are confusing. Parts of these sections indicate risk will be evaluated by guild (e.g., combining species) and other parts indicate fish, bird, and mammals will be assessed at the individual (for species of concern) or population level for each species. The latter should be included in the risk assessment.

Page 101. The last paragraph states that a crayfish-to-sediment regression relationship will be evaluated. The sculpin-to-sediment relationship also should be evaluated for use in deriving a biota-sediment accumulation factor.

Pages 125 to 126. Surface Sediment Approach. This bulleted section describes locations for sediment sampling, and is a biased approach because it is not random (primarily in order to save costs and evaluate worst-case conditions). How will this approach affect the distribution of contaminant concentrations in the results? Calculations of Exposure Point Concentrations (EPCs) to represent risks that are based on skewed or non-normally distributed data may not be protective of receptors. More information should be added here regarding the approach used to evaluate how well EPCs reflect the data distribution.

Page 128. Surface Water. This section should note that non-detection of some chemicals in water, such as those that are hydrophobic, does not mean that the chemicals are not present in the water, and does not mean that resources are not at risk from these chemicals. Other methods should be employed using time-integrated techniques with very low detection limits to represent hydrophobic chemicals in the water column. Risk cannot be evaluated for bioaccumulative, hydrophobic chemicals unless they are detectable. Therefore, the best technologies should be used that can result in extremely low detection limits.

Appendix B: Ecological Risk Assessment Approach

Page 5, Section 1.5, first paragraph, and page 6, Section 1.6, first paragraph. Site- and receptor-specific empirical data will be needed to support using a site use factor (SUF) value less than 100 percent for any receptor evaluated in the Ecological Risk Assessment (ERA). There is too much emphasis on the SUF in the hazard equation and this factor does not represent how a receptor uses the habitat. Section 1.6 states that "Following the PRE, more realistic, site specific assumptions will be used to more accurately characterize risk." Assumptions should not be used for estimating the site use. Rather, actual empirical evidence will need to be collected and evaluated to determine the receptor's use of the habitat within the Portland Harbor if anything less than 100 percent site use is proposed, and these studies should be described in the Work Plan.

Page 10, second paragraph. The third sentence is confusing. This sentence states that "However, because very little exposure and toxicity information is available that allows assessment of any single species the assessment may be performed as a community." How will this be done? There are numerous toxicology studies available for birds, and conservative estimates can be made based on birds in the same group as a receptor. It seems the statement can be interpreted as saying that when little data are available, less protective measures will be employed to evaluate risk. This is not an appropriate way to evaluate risk and should be changed, or better explained. As stated earlier regarding the assessment endpoints, risk should be evaluated in birds at the individual or population level.

Page 13, second to last paragraph. This section states that threatened and endangered bird species will be assessed at the individual level. In other sections, the Work Plan states special concern species will be individually protected. More clarity is needed as to the specific species that will be individually protected (Federal and State species listed as threatened, endangered, candidate, proposed, special concern, etc.). At the very least, federally listed threatened, endangered, candidate, and proposed species should be individually protected, as well as the State-listed species.

Page 26, line 3 from top. The specific name for the mountain sucker appears to be misspelled.

Page 37, Piscivores. Explain why bull trout, which are listed as “known to inhabit the region,” would not likely be found in the study area.

Page 44, second paragraph. A family of mink using a boat launch area on the west side of the Willamette River near Ross Island has recently been observed by a biologist. A photo of a juvenile mink killed at the site was taken. Therefore, mink are confirmed to be present and breeding outside the initial study area (ISA), and are most likely present and breeding within the ISA.

Page 44, Section 2.3.5. Italicize the first mention of the scientific name of the painted turtle in this section, and delete its scientific name in the following paragraph.

Page 46, Section 2.4.2. This section should list bull trout as another endangered species present in the area, or add a reason in this or an earlier section why bull trout would not likely be present in the ISA.

Page 47, Section 2.4.3. It should be noted in this section that bald eagles breed and are year-round residents in the area. Additional bald eagles may overwinter in the area. Also, the last sentence in the paragraph states “Any of these birds . . . have home ranges that extend well beyond the ISA.” This statement is misleading and we recommend that it be revised or deleted. Many birds breed in the area and have small ranges during the breeding season, and thus can be exposed to contaminants during a crucial life stage. As mentioned earlier, breeding bald eagles are present year-round, and while feeding young will forage primarily within 1 mile of the nest site. Thus, from a risk perspective, many birds spend their most crucial and sensitive life stage in a contaminated area, regardless of the extent of their full home range. The home range of birds and other animals is irrelevant from a risk perspective. How these animals use the area during critical periods is very relevant.

Page 74, Section 5.1. A sentence in this section states “In the BERA [Baseline Ecological Risk Assessment], a measure of central tendency will be calculated in addition to the upper-bound estimates of exposure and risk.” How will the measure of central tendency be used? Will it be used as an EPC in the BERA? This measure may not be appropriate to represent an EPC, and it is unclear what is being proposed in this section for use as an EPC in the BERA. Also, another

sentence states “The spatial unit for this iteration will not be based on the foraging range of the receptor, but will focus on the spatial boundaries for each source.” Why would not the foraging range of the receptor be useful in this situation? A bit more information on this would be helpful.

Page 77, third paragraph under Endpoint No. 2. A strategy should be outlined in the Work Plan or Field Sampling Plan to collect bivalve tissue for contaminant analysis.

Page 82, third paragraph. The LWG should evaluate the correlation between lipid content and contaminant concentrations in all tissues prior to lipid normalizing the data. Lipid value should increase with lipophilic contaminants. If the LWG data do not support this positive correlation, any lipid normalized data would be suspect. The LWG should further discuss with EPA and its partners how lipid normalized data will be used in the risk assessment.

Page 84, Assessment endpoints for birds and mammals. This section states that risk will be evaluated on a dietary-based Toxicity Reference Values (TRV). Risk should be assessed based on the most sensitive endpoint or life stage of receptors, and some birds species will require assessment of eggs or developing embryos. Chemical specific NOAEL and LOAEL values in bird eggs will be used to evaluate risks in birds, and the TRV calculation will need to incorporate these values in the hazard equation.

Page 84, equation 3. As stated earlier, the SUF in the equation is heavily weighted and is extremely subjective. The degree to which a receptor uses a site is highly variable and dependent on sex, age, breeding status, habitat and prey availability, and other factors, and cannot be represented by a single number or an estimated “fraction” of time a receptor uses a site. Therefore, unless site-specific data on each receptor are gathered, the SUF should be eliminated from the equation and the receptor should be considered to use the site 100 percent of the time.

Page 91. Delete extra line midway down the page and delete “)” after the Carl (1936) reference.

Table 3-4A. The units for PAHs are listed as “ug/L” and should be changed to “ug/kg.”

Table 5-1, page 55, Data Quality Objectives (DQOs). Some specific elements of the DQOs (such as the decision rules) may need to be changed as the Technical Memos are developed. The Technical Memos will provide more specific information on decision rules, etc. This should be noted in the table (that DQOs may be modified as a result of Technical Memo development). This issue may also pertain to Tables 7-1 to 7-11 in Volume 1 of the Work Plan.

Table 5-3, Step 3. Fish tissue collected for ecological analysis also included carp. Carp were primarily collected for human health risk, but it was agreed that the dioxins and planar PCBs data from carp were to be applied in the ecological risk assessment. Therefore, carp should be included in the list of fish used in the evaluation. Contaminants in carp would be used as an

indicator for other resident fish, and carp tissue will be used to evaluate trophic transfer of hydrophobic contaminants.

Figure 2-12. The pathway for sediment (direct contact/uptake) in crayfish is listed as complete and minor, which seems to contradict page 91 of the Work Plan (Volume 1) under "Epibenthic Microfauna," which states that "Crayfish are in direct contact with surface water and sediments, and this pathway is considered complete and major." It appears that this is an error in the figure and should be changed. Also, the figure indicates that direct contact/uptake of porewater is incomplete for nearly all receptors. It seems that invertebrates would be in direct contact with porewater so this should be changed to complete and major.

Attachment B5, Ecotoxicological profiles.

Substantial toxicological information is lacking in these profiles, and more information related to the chemicals of concern in the ISA should be added. Only certain areas of ecotoxicology are addressed for a receptor group; other methods or issues should be added if they directly pertain to the site. The profiles could be augmented with information from the "Handbook of Ecotoxicology, Second Edition" (David J. Hoffman, Barnett A. Rattner, G. Allen Burton, Jr., John Cairns, Jr., editors). The following are examples of data that should be added or text that should be adjusted.

- Section 2.2: No mention is made of behavioral impacts of metals to fish, such as copper, affecting migrating behavior of salmonids.
- Section 2.3: No mention is made of lead toxicity to birds.
- Section 3.3: Extensive field data has associated DDE to reduced productivity in wild breeding birds, aquatic birds and raptors. Laboratory and/or field data have also demonstrated the potential for DDE to induce eggshell thinning and egg dessication, which is excluded from the last sentence.
- Sections 5.3 and 6.0: No mention is made of egg-injection studies (as opposed to dietary studies). Legitimate, scientifically-controlled egg injection studies have been conducted on cormorants and other bird species. The effects observed from egg injection should be cited here, as these studies will be key in deriving risk factors for the assessment.
- Section 6.3, Birds: There have been numerous studies on the effects of PCDDs and PCDFs on wild birds, in contrast to what is stated here. Aside from egg injection studies, a number of field studies have been conducted by John Elliott and others in Canada on bald eagles and great blue herons, in the Great Lakes on cormorants and bald eagles, and in the Columbia River on osprey, bald eagles, and cormorants. References for these studies can be found in the final reports produced by our office (see web page "http://oregonfwo.fws.gov/EnvContam/EnvContam_Field/EC_Field_Studies.html" for reference sections within reports on bald eagles and cormorants). Numerous studies have been conducted on PCDD and PCDF effects on wild birds since the publication of the White and Seginak (1994).

Attachments B6 and B9

Pages 84 and 108, Section 2.0. This search should include field studies, and the risk assessment should examine the most sensitive life stage of a receptor to a chemical.

Pages 86 and 110. Change "Section 4.0" to "Section 5.0" as there are two section 4.0s.

Pages 85 to 86 and 109 to 110, Section 4.0. Egg injection studies and NOAEL/LOAEL values from hazard assessment calculations may need to be used for some receptors, and should be included in this section in Attachment B9. The rules to select TRVs in both these attachments should consider results from fields studies where significant associations are made, and results from hazard assessments where NOAELs/LOAELs or TRVs derived. For example, a risk evaluation to represent piscivorous bird exposure to bioaccumulative compounds should be based on the most sensitive endpoint (i.e., reproduction). The bioaccumulative chemicals DDE, PCBs, dioxins, and furans cause mortality or other impacts to the developing embryo or egg at lower levels than would impact adult birds through dietary exposure. Therefore, TRVs and no- or low-effect levels should be selected based on concentrations known or estimated to impact the developing embryo or egg. It is unclear from the Work Plan whether or not the TRV rules would prevent an evaluation of this type of risk. Therefore, the TRV rules should not limit the use of field studies and hazard assessment approaches to evaluate risk, especially to listed species. An example of deriving threshold values based on a hazard assessments can be found in the reference below.

Giesy J.P., W.W. Bowerman, M.A. Mora, D.A. Verbrugge, R.A. Othoudt, J.L. Newsted, C.L. Summer, R.J. Aulerich, S.J. Bursian, J.P. Ludwig and others. 1995. Contaminants of fishes from Great Lakes-influenced sections and above dams of three Michigan rivers: III. Implications for health of bald eagles. Archives of Environmental Contamination and Toxicology. 29:309-21.

Field studies and hazard evaluations should be considered equally with controlled laboratory studies (hazard assessments are generally based on controlled laboratory evaluations or field studies, so they should be acceptable, especially for assessing listed species) and the "TRV Study Review Form" on pages 87 and 112 should be revised to include this type of study (as well as including egg-injection studies on page 112).

Pages 85 and 109, last bullet statements in Section 4.0. The word "proven" should be deleted on these pages. "Proven" is unnecessary and not accurate, as a result is either statistically significant or not.

Attachment B7

Page 88, food web model. The LWG should evaluate correlations in contaminant concentrations between sculpin and sediment, between crayfish and sediment, and between bivalves and

sediment (after collection of additional bivalves and if co-located sediment is available). A regression approach should be used to determine a biota-sediment accumulation factor (BSAF) for each matrix provided an adequate correlation exists. The limitations or assumptions of this empirically-derived BSAF can then be discussed with the EPA and their partners to determine its suitability to the site. Meanwhile, the LWG should begin collecting site-specific data to populate parameters used in the proposed food web models. Many of these models will require the same parameters, so these data can be collected prior to deciding on which specific food web model to use. A Technical Memo should be produced describing the parameters needed for the food web models, and what site specific data will be used to fill the model.

Other comments

We still have concerns in the calculation of the EPC as mentioned in our previous comments on an earlier version of the Work Plan. The LWG addressed some of these concerns in the revised Work Plan, but still proposes to calculate an EPC using statistics that require a normal distribution to accurately represent the sample population, including using a mean value or measure of central tendency. The basis of the central limit theorem and derivation of a measure of central tendency are dependent on a random distribution; an assumption which will not likely be met based on the proposed sampling plan, so a measure of central tendency could grossly underestimate risk. Therefore, the mean or similar measure of central tendency would likely not be a biologically relevant value (it should be noted that the 95 percent UCL may not be representative either, but would likely be a conservative approach and less likely to underestimate risk, depending on how it is applied). Also, the proposed sampling plan includes biased sampling locations based on suspected contaminated sites. This bias, and how it may influence the results, should be described in the risk assessment. Some specific issues related to the EPC that should be discussed and agreed upon by the LWG and the EPA and its partners prior to completion of the Preliminary Risk Evaluation include 1) identification of the specific area of the ISA selected to represent a receptor; 2) selection of the specific sediment samples used to represent a receptor (prior to receiving analytical chemistry results); and 3) selection of the specific method or methods (such as area weighted averages, 95 percent confidence intervals, or nonparametric methods) used to calculate the EPC for a specific receptor. Method selection would be based on the spatial distribution of sediment samples and on how well sediment samples meet parametric statistical assumptions. These issues should be described in the Work Plan, or it should be stated in the Work Plan that the LWG will further refine the methods in a Technical Memo and with discussion with EPA and its partners.


There is still no approach in the ecological risk assessment to evaluate dioxin-like compounds (dioxins, furans, and planar PCBs). An approach to evaluate exposure of receptors to dioxin-like compounds needs to be added to the risk assessment. The approach should include a derivation of Toxic Equivalent (TEQ) values based on ecologically relevant Toxic Equivalent Factors (TEFs) from the World Health Organization, and the process should be explained in the risk document.

Ms. Tara Martich and Mr. Chip Humphrey

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Thank you for the opportunity to comment on the revised Work Plan. Please contact Jeremy Buck at 503-231-6179 should you need additional information regarding our comments.

Sincerely,


for Kemper M. McMaster
State Supervisor

cc:

Preston Sleeper, Regional Environmental Officer, U.S. Department of the Interior, Portland, Oregon